

What is claimed is:

1. A surgical instrument assembly for securing an implant to a vertebral level, comprising:

an inserter instrument including a proximal handle assembly, a shaft assembly operably coupled between said handle assembly and a distal holder assembly, said holder assembly being removably engageable to the implant and remotely movable with said handle assembly to orient the implant along a selected one of any number of implantation axes; and

a driving instrument engageable with said holder assembly and adapted to deliver a driving force to the implant along said implantation axis while said holder assembly is engaged with said implant.
2. The surgical instrument assembly of claim 1, wherein said shaft assembly extends along a longitudinal axis of said inserter instrument, and said holder assembly is movable relative to orient said implantation axis at an angle relative to said longitudinal axis.
3. The surgical instrument assembly of claim 2, wherein said orientation ranges from a first position orthogonal to said longitudinal axis to a second position substantially co-linear with said longitudinal axis.
4. The surgical instrument assembly of claim 1, wherein said holder assembly is pivotally coupled about a distal end of said shaft assembly.

5. The surgical instrument assembly of claim 4, wherein said holder assembly includes a pair of clamping members pivotally coupled to one another, said clamping members each including a distal gripping portion, said clamping members pivotal to move said distal gripping portions toward one another to engage the implant received therebetween and further being pivotal to move said distal gripping portions away from one another to release the implant engaged therebetween.

6. The surgical instrument assembly of claim 5, wherein said distal end of said shaft assembly comprises a camming member rotatable about said longitudinal axis between an engagement position and a release position.

7. The surgical instrument assembly of claim 6, comprising a retainer positioned about said camming member and a pair of opposite engagement members positioned in said retainer in contact with said camming member, wherein in said engagement position said engagement members project from said retainer into contact with a proximal extension of an adjacent one of said clamping members to move said distal gripping portions toward one another.

8. The surgical instrument assembly of claim 7, wherein in said release position said engagement members move toward one another into said retainer allowing said proximal extension to move toward one another and pivoting said distal gripping portions away from one another.

9. The surgical instrument assembly of claim 8, wherein:

said holder assembly includes a housing member pivotally linked to said shaft assembly;

said clamping members are pivotally coupled to a distal end of said housing member; and

said retainer is positioned in said housing member, said housing member including openings aligned with and receiving respective ones of the engagement members therethrough in said engagement position and said release position.

11. The surgical instrument assembly of claim 10, wherein said housing member includes a proximal end opening and said driving instrument is engageable in said proximal end opening to deliver said driving force thereto.

12. The surgical instrument assembly of claim 7, wherein said holder assembly is pivotally coupled to said engagement members.

13. The surgical instrument assembly of claim 5, wherein said holder assembly includes a housing member pivotally linked to said shaft assembly, said clamping members further being pivotally coupled to a distal end of said housing member.

14. The surgical instrument assembly of claim 13, wherein said housing member includes a proximal end opening and said driving instrument is engageable in said proximal end opening to deliver said driving force thereto.

15. The surgical instrument assembly of claim 1, wherein said shaft assembly includes a first member and a second member, said second member extending through said first member.

16. The surgical instrument assembly of claim 15, wherein said handle assembly includes a first handle pivotally coupled to a second handle, said first member being coupled to said first member and longitudinally movable relative to said second member in response to pivoting movement of said first handle relative to said first handle.

17. The surgical instrument assembly of claim 16, wherein said second member is coupled to said second handle and rotatable relative thereto about said longitudinal axis.

18. The surgical instrument assembly of claim 1, wherein said inserter instrument is insertable through a first port in the patient to position the implant at an implantation location and said driving instrument is insertable through a second, smaller port to engage said holder assembly at the implantation location.

19. A method for engaging an implant to at least one vertebra, comprising:
inserting the implant through a first port in the patient with an inserter instrument;
positioning the implant adjacent the vertebra;
remotely adjusting the orientation of an implantation axis of the implant with the
inserter instrument;
inserting a driving instrument through a second port in the patient; and
advancing the implant along the implantation axis with the driving instrument into
the vertebra while maintaining the position of the implant with the inserter instrument.

20. The method of claim 19, wherein the first port is a mini-thoracotomy and
the second port is a stab wound.

21. The method of claim 19, wherein the first port provides an opening into
the patient that is larger than an opening provided through the second port.

22. The method of claim 19, wherein the first and second ports provide access
to the thoracic portion of the spine.

23. The method of claim 19, wherein the implantation axis is transversely
oriented to a longitudinal axis of the inserter instrument.

24. The method of claim 19, wherein the implant is a staple and advancing the implant along the implantation axis includes advancing the implant into first and second vertebrae of a vertebral level.

25. The method of claim 19, further comprising:
inserting a second implant through the first port in the patient with the inserter instrument;
positioning the second implant adjacent a second vertebra;
remotely adjusting the orientation of an implantation axis of the second implant with the inserter instrument;
inserting a driving instrument through a second port in the patient; and
advancing the implant along the implantation axis with the driving instrument into the vertebra while maintaining the position of the implant with the inserter instrument.

26. The method of claim 25, wherein the implants each comprise a staple and advancing the implant along the implantation axis includes advancing a first one of the staples into vertebrae of a first vertebral level and advancing a second one of the staples into vertebrae of a second vertebral level.

27. The method of claim 19, wherein before inserting the implant, the method further comprises:
positioning an implant template instrument through the first port;

positioning a template at the distal end of the implant template instrument adjacent the vertebra; and
marking the vertebra with the template.

28. The method of claim 27, wherein positioning the implant template instrument includes bending a shaft of the implant template instrument

29. The method of claim 28, wherein marking the vertebra includes engaging the driving instrument to the implant template instrument and advancing markers of the template into the vertebra with the driving instrument.

30. The method of claim 29, wherein bending the shaft includes bending the shaft by manipulating the template with the driving instrument.

31. A surgical instrument assembly for securing an implant to a vertebral level, comprising:

an inserter instrument including a proximal handle assembly, a shaft assembly operably coupled between said handle assembly and a distal holder assembly, said holder assembly being removably engageable to the implant and remotely movable with said handle assembly to orient the implant along a selected one of any number of implantation axes;

an implant template instrument including a proximal handle, a shaft extending distally from said handle, and a template at a distal end of said shaft, the shaft being bendable to re-position said template relative to said handle; and

a driving instrument selectively engageable with said holder assembly and said template to deliver a driving force thereto.

32. The system of claim 31, wherein said driving instrument is adapted to deliver a driving force to said implant along the implantation axis while said holder assembly is engaged with said implant.

33. The system of claim 31, wherein said driving instrument is engageable to said template and movable to bend said shaft and reposition said template relative to said handle.

34. The system of claim 33, wherein said template includes at least a first marking member and a second marking members, said marking members drivable into respective ones of first and second vertebrae with said driving instrument to mark implant insertion locations thereon.

35. The system of claim 31, wherein said shaft of said implant template instrument is made from shape memory material.

36. The surgical instrument assembly of claim 31, wherein said inserter instrument and said implant template instrument are alternately insertable through a first port in the patient to position the implant and said template at an implantation location and said driving instrument is insertable through a second, smaller port to engage an inserted one of said holder assembly and said template at the implantation location.

37. The surgical instrument assembly of claim 31, wherein said shaft assembly extends along a longitudinal axis of said inserter instrument, and said holder assembly is movable relative to orient said implantation axis at an angle relative to said longitudinal axis.

38. The surgical instrument assembly of claim 37, wherein said holder assembly includes a housing member with a proximal end opening and said driving instrument is engageable in said proximal end opening to deliver said driving force thereto.